

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): An integral, substantially air impermeable polymeric membrane for use in an electrochemical apparatus or process comprising:

- a) a polymeric sheet comprising polymer and having a porous structure with a microstructure of nodes and fibrils and an interior volume of said porous structure between the nodes and fibrils,
- b) the polymeric sheet having distributed in the ~~polymer~~ nodes and fibrils of the polymeric sheet:
 - i) metal;
 - ii) an organic polymer; or
 - iii) a combination thereof, and
- c) said interior volume of said porous structure comprising a porosity of the polymeric sheet of greater than 35% and being at least partially filled with substantially occluded by an ion-exchange resin to provide ionic conductance for use in the electrochemical apparatus or process

~~wherein an interior volume of the porous structure of the polymeric sheet is substantially occluded by the ion-exchange resin.~~

Claim 2 (cancelled).

Claim 3 (original): The membrane of claim 1 wherein the polymeric sheet has distributed therein a precious metal.

Claim 4 (cancelled).

Claim 5 (currently amended): An integral, substantially air impermeable polymeric membrane for use in an electrochemical apparatus or process comprising:

a) a polymeric sheet comprising polymer and having a porous structure with a microstructure of nodes and fibrils and an interior volume of the porous structure between the nodes and fibrils,

b) fumed silica ~~the polymeric sheet having~~ distributed in the polymer nodes and fibrils of the polymeric sheet:

i) ~~inorganic particulate;~~

ii) ~~metal;~~

iii) ~~an organic polymer; or~~

iv) ~~a combination thereof, and~~

c) ~~said porous structure being at least partially filled with electrolyte~~
substantially occluding said interior volume of said porous structure to provide
ionic conductance for use in the electrochemical apparatus or process,

~~wherein the polymeric sheet has distributed therein fumed silica, and an~~
~~interior volume of the porous structure of the polymeric sheet is substantially~~
~~occluded by the electrolyte.~~

Claim 6 (original): The membrane of claim 1 wherein the polymeric sheet
has distributed therein titania.

Claim 7 (cancelled).

Claim 8 (original): The membrane of claim 1 wherein the polymeric sheet
has distributed therein platinum.

Claim 9 (original): The membrane of claim 1 wherein the polymeric sheet
has distributed therein platinum supported on a substrate.

Claim 10 (currently amended): A polymeric membrane for use in an
electrochemical apparatus or process comprising:

a) a polymeric sheet comprising polymer and having a porous structure
with a microstructure of nodes and fibrils and an interior volume between the
nodes and fibrils,

b) the polymeric sheet having distributed in the ~~polymer~~ nodes and fibrils:

- i) metal;
- ii) an organic polymer; or
- iii) a combination thereof, and

c) [[an]] said interior volume of said porous structure is substantially occluded by an ion-exchange resin to provide ionic conductance for use in the electrochemical apparatus or process,

wherein the polymeric sheet is expanded porous PTFE.

Claim 11 (cancelled).

Claim 12 (original): The membrane of claim 1, wherein the polymeric sheet has metal distributed therein.

Claim 13 (original): The membrane of claim 1, wherein the polymeric sheet has an organic polymer distributed therein.

Claim 14 (original): The membrane of claim 1, wherein the polymeric sheet has a thickness of less than 50 microns.

Claim 15 (original): The membrane of claim 1, wherein the membrane is disposed between two fuel cell electrodes.

Claim 16 (canceled).

Claim 17 (previously presented): The membrane of claim 15, wherein the polymeric sheet has a thickness of less than 38 microns, and wherein the

membrane that is disposed between said two electrodes of a fuel cell provides a steady state current of at least 1.78 amps/cm² at 0.5 volts, with no humidification of incoming fuel cell air and hydrogen reactants, with air and hydrogen feed both at 40 psig and 25°C, and the fuel cell temperature at 50°C.

Claims 18-23 (cancelled).

Claim 24 (previously presented): The membrane of claim 1, wherein said ion-exchange resin is fluorinated.

Claim 25 (previously presented): The membrane of claim 14, wherein the polymeric sheet has a thickness between 13 microns and 50 microns.

Claim 26 (cancelled).

Claim 27 (previously presented): The polymeric membrane of claim 1 in which the polymeric sheet comprises a porous polymeric film; and the ion exchange resin is a polymer different from the polymeric film.

Claim 28 (currently amended): The polymeric membrane of claim 1 in which said interior volume of said porous structure comprises a porosity of the polymeric sheet ~~[[has]]~~ comprises a porosity of the polymeric sheet of 40% to 95%.

Claim 29 (currently amended): The polymeric membrane of claim 1 in which said interior volume of said porous structure comprises a porosity of the polymeric sheet ~~[[has]]~~ comprises a porosity of 70% to 95%.

Claim 30 (previously presented): The polymeric membrane of claim 1 in which the polymeric sheet comprises an expanded porous PTFE film having substantially fibrils with substantially no nodes present.

Claim 31 (cancelled).